

**EGS Science System and Operations  
Pre - Certification Test Activities Definition and Tracking  
Planning Document**

**WORKING DRAFT**

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## **1.0 Overview**

The EGS Science System and Operations Certification plan for verification of “at launch capabilities” at GSFC, EDC, LaRC, and post-launch capabilities at NSIDC, was described in a recent document “EGS Science System and Operations Certification Plan Development Process Description Document – *working draft, submitted to OWG on 12/1/97.*

The goal of the certification tests is to verify and formally demonstrate that the EGS Science System meets key EGS system level functional, interface, and performance requirements such that the system capabilities and operational procedures are adequate at launch for AM1, Landsat-7, and SAGE III science operations support. The tests will be planned and conducted jointly by EGS I&T and the DAAC organizations at the GSFC, LaRC, EDC, and NSIDC<sup>1</sup> DAACs. The test results are direct input to and preparation for the Operations Readiness Review (ORR) milestone.

As originally described in the document referenced above, the certification tests were to be preceded by system readiness/qualification tests, run jointly by the DAACs and EGS I&T. Since December 1, 1997, this strategy has changed, and it has been decided to delete the EGS I&T/DAAC joint system readiness/qualification tests and instead use the results of the AT tests as the prerequisite to verify the ECS SDP functions prior to EGS Science System & Operations Certification. It is also necessary to verify that the DAAC Operations Procedures are adequately verified during the A/T tests. The external and internal ECS interfaces at each DAACs are tested during the A/T test window.

The purpose of this document is to define how these pre-certification test activities will be defined and tracked from the perspective of their role as prerequisites to the EGS Science System and Operations Certification tests.

## **2.0 Scope of Pre Certification Tests**

### **2.1 Interface tests**

The Interfaces between each DAAC and its external interfaces will be tested by EGS I&T in association with the DAAC to verify their functional and performance capabilities. The inter DAAC interfaces are tested as part of SV/AT tests. It is essential to ensure that operational interfaces which are proposed to be used for the certification tests are verified.

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<sup>1</sup> The NSIDC DAAC certification is expected to occur post-launch with “drop 5” of the Release 2.0 ECS SDP integrated into the EGS.  
prepared by Intermetrics EGS I&T, 12/16/97

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## **2.2 Functional Qualification using Acceptance Tests**

As indicated in Section 1.0, the ECS SDP Acceptance Test results will be used to verify essential pre-certification requirements (Qualification/ Operations Readiness). A/Ts are generally at the subsystem level in a test environment. This document proposes preparation of a Pre-certification Test Activity Matrix to identify the pre-requisite activities which are needed for successful completion of the Certification Tests, within the available test window. The Test Activity Matrix will be based on the DAAC Operational Rehearsal Scenarios, Acceptance Tests and DAAC Operations Procedures.

## **2.3 DAAC Operations Procedures**

One important aspect of DAAC operations rehearsal plan is to exercise the scenarios to verify the DAAC operations procedures. It is now expected that the DAAC operations procedures will be used in acceptance tests, and actions will be taken by EGS I&T and the DAACs to identify unverified operations procedures for appropriate additional tests.

## **3.0 Pre Certification Activities Plan**

Identification of the pre-requisite

Verification of interfaces and some identified launch critical functions, as a pre-requisite, is considered necessary for ensuring successful completion of the certification tests, in the available time frame. These pre-requisites are:

- all external and internal interfaces are working according to the specifications,
- DAAC Operations Procedures are verified.
- critical functions which are necessary for the successful completion of the Certification Tests are verified (at subsystem level) for:
  - L0 data ingest and archive,
  - product generation and /or archive,
  - data manipulation,
  - data access and distribution.

## **3.1 External Interface Tests<sup>2</sup>**

EGS I&T has developed a series of Interface Confidence Tests ( ICTs) for external interfaces, as part of the EGS I&T activities. It is proposed to conduct these tests as required at all the DAACs. The interfaces identified for testing are given in Table 3-1, which will be updated with inputs from the respective DAACs.

<b>GSFC to</b>	<b>EDC to</b>	<b>LaRC to</b>	<b>NSIDC to</b>
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<sup>2</sup> DAAC to DAAC interfaces are not included.  
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<b>GSFC to</b>	<b>EDC to</b>	<b>LaRC to</b>	<b>NSIDC to</b>
EDOS (ICT3)	Landsat (ICT8)	EDOS (ICT3)	MODIS SCF (ICT1)
DAS (ICT5)	ASTER (ICT12)	CERES SCF (ICT1)	
NOAA (ICT4)	MODIS SCF (ICT1)	MISR SCF (ICT1)	
MODIS SCF (ICT1)	ASTER SCF (ICT1)	MOPITT SCF (ICT1)	
		SAGE III SCF (ICT1)	
		SAGE III MOC (ICT15)	
		NOAA (ICT4)	

**Table 3-1 External Interfaces for verification at DAACs**

### **3.2 DAAC Operations Procedures**

Verification of DAAC operations procedures is one of the important activities to be completed before the Certification tests. The operations readiness scenarios developed by DAACs cover all major operations procedures required to be verified, during the pre-certification activities. An assumption of this approach is that the ECS SDP developer, in conjunction with DAAC input, has mapped DAAC Operations Rehearsal scenarios to all associated A/Ts, and that as the A/Ts execute system functions which require use of associated DAAC operations procedures, the DAACs will exercise these related procedures as part of the Operations Readiness activities. In addition, it is proposed that as part of the pre-certification activities, the A/T tests will be reviewed to identify operations procedures not covered. All operations procedures not used will be verified by additional tests.

### **3.3 Pre-Certification Test Activity Matrix**

It is proposed to prepare a separate Test Activity Matrix for GSFC, EDC, LaRC and NSIDC, to examine the extent to which the A/Ts meet the pre-requisite test activities. The matrix will be based on the DAAC Operational Rehearsal Scenarios, and include reference to EGS-DAAC Certification System Level Tests, and the related Acceptance Tests (A/Ts) which are traced to the scenarios. This matrix will be used as a “check-off” list to track and evaluate the extent that the prerequisite test activities required for execution of the joint EGS I&T-DAAC Science & Operations Certification Tests have been completed prior to the certification test period.

The A/Ts will be reviewed for applicability and completeness from that perspective. The test activity matrix will be built and updated with active participation of the concerned DAAC. The test activity matrix will be used to identify the areas if any, where the A/Ts fall short of the pre-certification requirements, so that appropriate workarounds are implemented. Expected results as defined in the A/Ts will be evaluated for DAAC Operations interpretation, and potential differences in the expected results which may impact Operational Science System or Procedural certification and Ops Readiness will be identified.

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### **3.3.1 Preparation of Test Activity Matrix**

Draft Operations Rehearsal Scenarios identified for EDC, GSFC, NSIDC and LaRC will form the basis for identifying the activities to be completed as part of pre-certification activities. The procedure for preparation of the Test Activity Matrix for each DAAC is:

1. Identify all Launch Critical and Launch Essential Rehearsal Scenarios<sup>3</sup>
2. For each scenario, obtain tables which trace all applicable A/Ts as identified by ECS
3. Identify the relevant EGS Certification tests for each Scenario
4. Identify the relevant formal EGS ICT Interface tests for each Scenario
5. Identify the relevant DAAC specific Operations Procedures which need to be exercised during the A/T test window for each Scenario
6. For each Acceptance Test identified in step 2 above, review the scope, expected results, acceptance criteria, and provide comments for changes as necessary.
7. Review all the A/Ts traced to each Scenario 'as a group' and specify if they completely test the scenario; if not identify the parts of the scenario not addressed by the A/Ts

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<sup>3</sup> Step 1 was completed as part of the the Certification Test Scope definition through the DAAC 3 Days in the Life Timelines and Ops Rehearsal Scenario reviews. As the Certification Test Scope is refined to reflect Launch Critical and Launch Essential priorities, the Pre-Certification Test Activity scope will be modified.

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**3.3.2 Presentation of the Test Activity Matrix.**

The results of the analysis/review will be presented as two tables. Table 3-2 giving the DAAC Operations Rehearsal Scenarios as traced to A/Ts and EGS Certification Tests and Table 3-3 giving details of the analysis.

No	Scenarios	Task/activity/operation	Traced SV and Acceptance tests	Relevant EGS tests	Relevant Interface tests	Relevant Operations Procedures	Remarks
1	E-LC-1	ETM+LOR Ingest and Archive	Push- B 090410.010\$E, E to E- B 120650.010\$E	EGS 5, EGS10	?	?	
2	E-LC-2	User Registration	SV-TC0065, Pull-B 100110.010\$E	EGS10, EGS5, EGS9, EGS11	?		
3	E-LC-3	ETM+ LOR and ASTER L1a/L1b Data query Browse and order	Pull-B 100110.100\$E, Pull-B 100130.040\$E,	EGS5			
4	E-LC-4	Request level Order Tracking	S-Mgt-B 080150.010\$E Pull- B 100110.100\$E	?			

**Table 3-2                  Example          DAAC          EDC**

No	Scenarios	SV and A/Ts	Comments on the Expected Results, Acceptance Criteria (on SV and A/Ts)	Remarks
1	E-LC-1	Push- B 090410.010\$E, E to E- B 120650.010\$E	(comments based on the review of each A/T)	(Consolidated remarks-are the A/Ts traced to Scenarios adequate?)
2	E-LC-2	SV-TC0065, Pull-B 100110.010\$E		
3	E-LC-3	Pull-B 100130.040\$E, Pull-B 100110.100\$E,		
4	E-LC-4	Pull- B 100110.100\$E S-Mgt-B 080150.010\$E		

**Table 3-3                  Example          DAAC          EDC**

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**4.0 Pre Certification Test Activities-- Allocation of Responsibility**

The table below lists open action items that need to be completed in order to complete the Pre-certification Test Activity matrix for planning purposes, and to use it during the Pre-certification test period to track the activities .

No	Activity	primary Responsibility	Support	Review	Remarks
1	Prepare the Test Activity Matrix	EGSI&T	DAAC	DAAC	
2	Prepare the Interface tests	EGS I&T		DAAC	
2	Conduct Interface Tests	DAAC and EGSI&T			
3	Prepare Operations Procedures to be completed during Pre-certification Ops Readiness Exercises	DAAC			
4	Review A/T procedures	DAAC	EGSI&T		
5	Execute Operations Procedures	DAAC			note: ECS AT test organization role to be defined
6	Monitor A/T Tests	DAAC and EGSI&T			